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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,960	03/31/2004	Xiang Liu	Liu 28	5886

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Lucent Technologies Inc.
Docket Administrator
Room 3J-219
101 Crawfords Corner Road
Holmdel, NJ 07733-3030

EXAMINER

LE, THI Q

ART UNIT	PAPER NUMBER
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2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/813,960	LIU, XIANG	
	Examiner	Art Unit	
	Thi Q. Le	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,3,5,15,16,18,20,30 and 31 is/are rejected.
- 7) ☐ Claim(s) 2,4,6-14,17,19 and 21-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: <u>7/27/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 7/25/2005 is being considered by the examiner.

Drawings

2. The drawings are objected to because in **figure 2, reference number 201** is labeled as FEC decoder, while in the specification reference number 201 is referred as FEC encoder. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. **Claims 1-2, 7, 10, 13-17, 22, 25 and 28-31** are objected because they recite terminology of proximity.

a) **Claims 1-2, 7, 10, 13-14, 16-17, 22, 25 and 28-31** use the term “**about**” to characterize numerical values. The term “about” is considered to be terminology of proximity and it does not describe the meets and bound of a claimed limitation; therefore it is objected.

b) **Claim 15** uses the term “**substantially**” to describe the characteristics of a sinusoidal drive signal. The term “substantially” is considered to be terminology of proximity and it does not describe the meets and bound of a claimed limitation; therefore it is objected.

4. **Claim 15** is objected to because of the following informalities:

a) On **line 2** of **claim 15**, replace “ore” with --or-- after “sinusoidal drive signal at one”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 1-31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 16, 30 and 31 claims there are a plurality of frequencies $f_1 \dots f_m$

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wherein:

$$f_1 \geq f_2 \dots \geq f_m$$

$$f_1 \geq \text{about } BR / (BECL \times N); \text{ and}$$

wherein BR is the highest bit rate of the optical signal, and BECL is a maximum burst error correction length of forward error correction used in the optical communication system.

The claims are indefinite because a plurality of frequencies $f_1 \dots f_m$ were claimed, but only f_1 has a relationship with $BR / (BECL \times N)$; $f_2 \dots f_m$ has no relationship with $BR / (BECL \times N)$, thus, it is not clear how $f_2 \dots f_m$ are ascertain (in other words, $f_2 \dots f_m$ can be any value as long as it is below to equal to f_1). In the specification paragraphs 0054-0055, there was limited description about the range of the preferred PSM speed in the invention, but there was no clear description about $f_2 \dots f_m$. The applicant is advised to revise the claims such that $f_2 \dots f_m$ are related to BR and BECL; thus, the values for $f_2 \dots f_m$ can be ascertain and not just any frequencies below f_1 (e.g. $f_1 \dots f_m \geq BR / (BECL \times N)$).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 1, 3, 5, 16, 18, 20, 30-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamaguchi (US Patent # 6,847,743)** and in view of **Otsuka et al. (US Patent # 5,841,557)**.

Consider **claim 1**, Yamaguchi clearly shows and discloses, a polarization scrambler apparatus (read as, polarization scrambler unit 205; figure 5) comprising (note, intended use in the preamble are not given patentability weight): M polarization controllers (read as, the polarization controller is inherently located within polarization scrambler 2-1 to 2-4; figure 5); and drive circuitry (read as, scrambler driving circuit 11-1 to 11-4; figure 5) adapted to drive the M polarization controllers at one frequency (note, since the claim limitation requires only 1 frequency, out of the plurality of frequencies, to drive the polarization controllers; further only frequency f_1 is subjected to the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", while $f_2 \dots f_m$ are not subjected to the same limitation as f_1 ; so, a reference that discloses driving the polarization controllers with $f_2 \dots f_m$ does not need to meet the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", since $f_2 \dots f_m$ are not subjected to the limitation) (note, the Examiner take that, Yamaguchi disclose a polarization scrambler wherein the frequency of the drive signal is not f_1 ; further it is well known in the art that polarization scramblers are driven with a drive signal of a particular frequency) (figure 5 column 4 lines 12-22 and lines 46-56; column 7 lines 9-26). Yamaguchi fails to disclose, driving a polarization controller at a plurality of frequencies $f_1 \dots f_m$.

In related art, Otsuka disclose, a polarization scrambling optical transmission system wherein, the polarization controllers (read as, polarization scrambler 14-1 to 14-m; figure 17) are driven with a plurality of frequencies (read as, frequencies f_1 to f_m ; figure 17; column 20 lines 37-56).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Otsuka with Yamaguchi. Since scrambling optical signals with a plurality of frequencies provides suppression of non-linear optical effects and improves optical signal to noise ratio.

Consider **claim 3**, and **as applied to claim 1 above**, Yamaguchi as modified by Otsuka further disclose wherein at least two of the plurality of frequencies $f_1 \dots f_m$ are not equal (read as, frequencies f_1 to f_m are different from each other; Otsuka, column 20 line 44).

Consider **claim 5**, and **as applied to claim 1 above**, Yamaguchi as modified by Otsuka further disclose wherein the polarization controller comprises a waveplate (read as, the polarization controllers within polarization scrambler 2-1 to 2-4 are made up of wave plates; Yamaguchi, figure 12-1, column 2 line 1).

Consider **claim 16**, Yamaguchi clearly shows and discloses, an optical communications method comprising (note, intended use in the preamble are not given patentability weight): driving M polarization controllers at one frequency (read as, driving circuits 11-1 to 11-4 drive a polarization scramblers 2-1 to 2-4 (it is understood that polarization controllers are located in the polarization scrambler, figure 12-1) at a particular frequency) (figure 5 column 4 lines 12-22 and lines 46-56; column 7 lines 9-26) (note, since the claim limitation requires only 1 frequency, out of the plurality of frequencies, to drive the polarization controllers; further only frequency f_1 is

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subjected to the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", while $f_2 \dots f_m$ are not subjected to the same limitation as f_1 ; so, a reference that discloses driving the polarization controllers with $f_2 \dots f_m$ does not need to meet the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", since $f_2 \dots f_m$ are not subjected to the limitation) (note, the Examiner take that, Yamaguchi disclose a polarization scrambler wherein the frequency of the drive signal is not f_1 ; further it is well known in the art that polarization scramblers are driven with a drive signal of a particular frequency). Yamaguchi fails to disclose, driving a polarization controller at a plurality of frequencies $f_1 \dots f_m$.

In related art, Otsuka disclose, a polarization scrambling optical transmission system wherein, the polarization controllers (read as, polarization scrambler 14-1 to 14-m; figure 17) are driven with a plurality of frequencies (read as, frequencies f_1 to f_m ; figure 17; column 20 lines 37-56).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Otsuka with Yamaguchi. Since scrambling optical signals with a plurality of frequencies provides suppression of non-linear optical effects and improves optical signal to noise ratio.

Consider **claim 18**, and **as applied to claim 16 above**, claim 18 is rejected for the same reason as claim 3 above.

Consider **claim 20**, and **as applied to claim 16 above**, claim 20 is rejected for the same reason as claim 5 above.

Consider **claim 30**, Yamaguchi clearly shows and discloses, an optical communication system comprising (note, intended use in the preamble are not given patentability weight): a plurality of polarization scrambler modules distributed among a plurality of N nodes of the

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optical communication system (read as, distributed polarization scrambler units 20-1 to 20-k; figure 10), the polarization scrambler modules including: M polarization controllers (read as, the polarization controller is inherently located within polarization scrambler 2-1 to 2-4; figure 5); and drive circuitry (read as, scrambler driving circuit 11-1 to 11-4; figure 5) for generating drive signals to drive the M polarization controllers (figure 5 column 4 lines 12-22 and lines 46-56; column 7 lines 9-26) (note, since the claim limitation requires only 1 frequency, out of the plurality of frequencies, to drive the polarization controllers; further only frequency f_1 is subjected to the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", while $f_2 \dots f_m$ are not subjected to the same limitation as f_1 ; so, a reference that discloses driving the polarization controllers with $f_2 \dots f_m$ does not need to meet the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", since $f_2 \dots f_m$ are not subjected to the limitation) (note, the Examiner take that, Yamaguchi disclose a polarization scrambler wherein the frequency of the drive signal is not f_1 ; further it is well known in the art that polarization scramblers are driven with a drive signal of a particular frequency). Yamaguchi fails to disclose, driving a polarization controller at a plurality of frequencies $f_1 \dots f_m$.

In related art, Otsuka disclose, a polarization scrambling optical transmission system wherein, the polarization controllers (read as, polarization scrambler 14-1 to 14-m; figure 17) are driven with a plurality of frequencies (read as, frequencies f_1 to f_m ; figure 17; column 20 lines 37-56).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Otsuka with Yamaguchi. Since scrambling optical signals with a plurality of frequencies provides suppression of non-linear optical effects and improves optical signal to noise ratio.

Consider **claim 31**, Yamaguchi clearly shows and discloses, an apparatus for polarization scrambling at one or more of N nodes of an optical communication system, comprising (note, intended use in the preamble are not given patentability weight): a plurality of M polarization controller means (read as, the polarization controller is inherently located within polarization scrambler 2-1 to 2-4; figure 5); and means for driving the polarization controller means at a frequency (read as, scrambler driving circuit 11-1 to 11-4; figure 5) (figure 5 column 4 lines 12-22 and lines 46-56; column 7 lines 9-26) (note, since the claim limitation requires only 1 frequency, out of the plurality of frequencies, to drive the polarization controllers; further only frequency f_1 is subjected to the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", while $f_2 \dots f_m$ are not subjected to the same limitation as f_1 ; so, a reference that discloses driving the polarization controllers with $f_2 \dots f_m$ does not need to meet the limitation " $f_1 \geq \text{about } BR / (BECL \times N)$ ", since $f_2 \dots f_m$ are not subjected to the limitation) (note, the Examiner take that, Yamaguchi disclose a polarization scrambler wherein the frequency of the drive signal is not f_1 ; further it is well known in the art that polarization scramblers are driven with a drive signal of a particular frequency). driving a polarization controller at a plurality of frequencies $f_1 \dots f_m$.

In related art, Otsuka disclose, a polarization scrambling optical transmission system wherein, the polarization controllers (read as, polarization scrambler 14-1 to 14-m; figure 17) are driven with a plurality of frequencies (read as, frequencies f_1 to f_m ; figure 17; column 20 lines 37-56).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Otsuka with Yamaguchi. Since scrambling optical

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signals with a plurality of frequencies provides suppression of non-linear optical effects and improves optical signal to noise ratio.

10. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamaguchi (US Patent # 6,847,743)** and in view of **Otsuka et al. (US Patent # 5,841,557)** and further in view of **Fujiwara et al. (US Patent # 7,106,970)**.

Consider **claim 15**, and as applied to **claim 1** above, Yamaguchi as modified by Otsuka disclosed the drive circuitry generates one or more drive signals at one ore more of the plurality of frequencies, to drive the M polarization controllers (Otsuka; figure 17, column 20 lines 37-56); but fail to clearly disclose, wherein the drive circuitry generates a substantially sinusoidal drive signals.

The Examiner take office notice that it would have been obvious for a person of ordinary skill in the art at the time of the invention to know, that a driver circuit producing drive signal, with a particular frequency, use for driving the polarization scrambler is sinusoidal in characteristic. Further, in related art, Fujiwara disclose a polarization scrambler driven by a sinusoidal drive signal. Wherein the drive circuitry (read as, oscillator 115; figure 16) generates one or more substantially sinusoidal drive signals (figure 16; column 21 lines 1-12).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Weid et al.; 2004/0202480

b) Fee et al.; 6,889,011

c) Frigo et al.; 7,095,912

12. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

13. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Thi Le whose telephone number is (571) 270-1104. The Examiner can normally be reached on Monday-Friday from 7:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Thi Le


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER